Peer Review File

Review Comments (Round 1)

Reviewer A: *The authors provide a review of the literature of robot-assisted surgery in pediatrics. I have the following questions and comments:*

1) Figure 2: How were these numbers obtained? From all the 824 articles or the 10 final studies considered?

Response: We appreciate the Reviewer's comment. The numbers reported in the Figure 2 were obtained from the 239 articles retrieved after the initial screening, as stated in the Results section (*see Pages 5-6, Lines 117-120*).

2) A table must be included with synopsis of the 10 final studies included (study, type of study, case number, type of case, follow-up, complication rate............)

Response: We appreciate the Reviewer's comment. As suggested, an overview table on studies included in the final analysis was included (*see Table 3*).

3) The authors need to expand on how the 10 selected article provide evidence-based recommendations. This is unclear in the manuscript.

Response: We appreciate the Reviewer's comment. To better clarify how the selected articles provide evidence-based recommendations, "key contents" and "level of evidence" columns are provided in the overview table on selected articles which was added (*see Table 3*).

Reviewer B: *Boscarelli et al. summarized the current status of robotic surgery in pediatric surgery in their narrative review. With the increasing spread of robotic surgery, it is important to gain and keep an overview of the possible applications. Therefore, I consider the review of the authors to be very important and interesting in principle. The work is well written, I did not notice any formal mistakes worth mentioning. However, I have some serious remarks:*

1) The authors describe in sufficient detail the process of their data collection. However, it is not clear here which criteria are used in the second step of narrowing down the selected studies (from 239 to 10). The authors state the level of evidence, but it is not clear why this is so crucial when only a narrative evaluation is planned anyway.

Response: We appreciate the Reviewer's comment. We decided to select the 10 papers with the highest level of evidence among the 239 articles retrieved after the initial screening, as stated in the Results section (*see Page 6, Lines 122-125*). Moreover, according to the reviewer's comment, we removed the level of evidence from the Key Content and Findings section of the Abstract (*see Page 3, Lines 59-60*).

2) At least a table of the included papers with an assessment of their evidence would be desirable.

Response: We appreciate the Reviewer's comment. As suggested, an overview table on studies included in the final analysis was included (*see Table 3*).

3) In terms of content, the discussion falls short of its potential: First, the content of the included papers should be briefly recapitulated, then this should be put in context, e.g. with robotic surgery in adults. In its current form, the reader can learn very little that is new.

Response: We appreciate the Reviewer's comment. To better clarify how the selected articles provide evidence-based recommendations, "key contents" and "level of evidence" columns are provided in the overview table on selected articles which was added (*see Table 3*). Moreover, we tried our best to recapitulate the content of the included papers in the different paragraphs of the Discussion section.

4) The peculiarities of pediatric surgery (in addition to the space problem of the robotic access routes) are not sufficiently explained.

Response: We appreciate the Reviewer's comment. We tried our best to resume the peculiarities of the Da Vinci Surgical System and the peculiarities of its use in pediatric surgery in the Introduction section (*see Page 4, Lines 81-91*) and in the Discussion section (*see Page 9, Lines 199-203*).

I also have a few minor comments:

1. The manufacturer of the DaVinci is listed several times in the introduction, this is not necessary.
Response: We appreciate the Reviewer's comment, and accordingly the manufacturer of the Da Vinci has been listed only the first time.

2. The heading "Main Body" is not necessary. Response: We appreciate the Reviewer's comment, and accordingly the heading "Main Body" was removed.

3. It is unclear to which data Figure 2 refers. Response: We appreciate the Reviewer's comment. The numbers reported in the Figure 2 were obtained from the 239 articles retrieved after the initial screening, as stated in the Results section (*see Pages 5-6, Lines 117-120*).

4. There may still be differences between pediatric and neonatal surgery. There are now other manufacturers who have brought their robots to market maturity, e.g. CMR or Medtronic. Whether these play a role in pediatric surgery is not mentioned. Response: We appreciate the Reviewer's comment. A mention of other manufacturers which are developing new platforms with instruments able to play a role in pediatric surgery is referenced both in the Introduction section (*Page 4, Lines 88-91*) and in the Discussion section (*Page 9, Lines 199-203*).

Reviewer C: *This manuscript is very well written, and the objective is both timely and clearly stated in the introduction. The current evidence supporting the introduction of robotic-assisted pediatric surgery is still scarce, and the available literature represents a largely heterogeneous*

patient population. Therefore, the authors mainly focus on providing a narrative overview of the distribution of level I/II evidence studies across various fields of pediatric surgery. Although the authors report their findings in the style of a narrative review, some systematic additions would greatly improve the quality of the manuscript. Before publication, I suggest the following changes:

1) In the main title, the authors pose the question "What is evidence-based?". This question could perhaps be specified and answered more directly in the introduction and conclusions, respectively. Generally, the authors could elaborate more on which specific outcomes are in fact improved according to the suggested evidence available from the current literature review, since many of these outcomes are in fact the same across various surgical fields (e.g., perioperative complications, surgical site infections, length of hospitalization).

Response: We appreciate the Reviewer's comment. To better clarify the answer to the question posed in the main title, the following sentences were modified or added in the Discussion section:

- "Furthermore, the use of RAS in some subspecialties, such as for hepatobiliary diseases, is still limited by the lack of comparative studies and large-scale case series that confirm the advantages of minimally invasive surgery in these patients [17]. Interestingly, recent studies including systematic reviews, meta-analyses, comparative studies, and prospective case-series showed the safety and feasibility of laparoscopic surgery for choledochal cyst excision and cholecystectomy [17, 18-21]; however, it cannot be actually recommended for infants with biliary atresia and pediatric hepatobiliary tumors [17,22,23]." (*see Page 6-7, Lines 144-150*);

- "In two retrospective multicentric studies recently published, the authors concluded that RATS could be suitable for older children with a body weight of at least 15-20 kg, and currently there is a persistent lack of evidence that lower weight children and neonates are candidates for RATS due to an incompatibility between the size of the robotic instruments, the intercostal space, and the small thoracic working space [30,31]." (*see Page 7, Line 164-168*);

- "Interestingly, a review of the literature and a meta-analysis reporting outcomes of children undergoing mini-invasive fundoplication found no significant difference in terms of conversions, operating time, length of hospital stay, and postoperative complications. Nevertheless, the results are significantly limited by the absence of long-term follow-up. Notably, the cost analysis revealed a 29% higher per case cost for robotic procedures [33,34]." (*see Page 8, Lines 170-175*);

- "However, a recent systematic review and meta-analysis found no significant difference between the success rates of laparoscopic or robotic-assisted pyeloplasty; while the operating time and overall complication rate were significantly higher for robotic-assisted procedure [44]." (*see Page 8, Line 187-190*);

- "Undoubtedly, RAS is rare in pediatric oncology due to the rarity of pediatric tumors, and the principal matter of debate remains whether the fundamental oncological principles of no spillage and total resection of the margins can be fulfilled with the use of RAS [6,35]. Consequently, robotic surgery for pediatric tumors is considered a safe option only in highly selected cases [45]." (*see Page 8-9, Line 191-195*).

2) Ideally, the authors should include an overview table summarizing all the 10 studies included in the final synthesis. This would allow the authors to better discuss specific outcomes of interest, as well as comparator groups (i.e., laparoscopic or open), for each of the included studies. The table should briefly present main study characteristics and outcomes, as well as the graded level of evidence.

Response: We appreciate the Reviewer's comment. As suggested, an overview table on studies included in the final analysis was included (*see Table 3*).

3) The evidence level of each included study is assessed according to the Oxford guidelines, however, these guidelines should be referenced and briefly recapitulated for the reader (preferably in a table exemplifying each evidence level) in the methods section, since this part of the methodology is central to the final conclusions of the current study.

Response: We appreciate the Reviewer's comment. As suggested, a table exemplifying each evidence level according to Oxford score was added (*see Page 5, Lines 108-110 and Table 2*).

4) An independent supplement table should be added to present detailed search strategy (i.e., a search string should be specified) of at least one database as an example (preferably MEDLINE). Please see instructions for table 1, row 3. It is unclear to me whether the current search strategy would have picked up phrasings such as "robot-assisted", "urology", "oncological" etc.

Response: We appreciate the Reviewer's comment. As suggested, an independent supplement table was added to present detailed search strategy (*see supplementary Table 1*). Moreover, the details reported in the table on search strategy summary have been enriched (*see Table 1*).

5) The specific search date should be specified (currently only specified as month and year).

Response: We appreciate the Reviewer's comment. The search date was specified as requested (*see Table 1*).

6) Authors should state why a specific cut off was set at year 2010, since numerous predating publications on robotic-assisted pediatric surgery exist.

Response: We appreciate the Reviewer's comment. We decided to set the cut off of our research at year 2010, because of the increased use of Da Vinci in pediatric patients starting from that date onward.

7) Besides a study decision flow diagram, the PRISMA statement also includes a rather extensive checklist (https://prisma-statement.org//documents/PRISMA_2020_checklist.pdf) which the authors must comply with in order to reference it. This is however not mandatory in a narrative review, so alternatively I suggest removing the PRISMA reference.

Response: We appreciate the Reviewer's comment. As suggested by the Reviewer, the PRISMA reference was removed.

8) The da Vinci Robotic System only needs to be fully referenced (i.e., Intuitive Surgical, Sunnyvale, CA, USA) at the first mention (line 73).

Response: We appreciate the Reviewer's comment. As suggested by the Reviewer, the manufacturer of the Da Vinci has been listed only the first time.

9) A risk of bias assessment of the final included studies (preferably following the ROBINS-I assessment tool) would furthermore improve the manuscript quality, although this part is not considered mandatory in a narrative review.

Response: We appreciate the Reviewer's comment. To further improve the manuscript quality, a risk of bias assessment according to the ROBINS-I assessment tool was briefly reported in the end of Discussion section (*see Page 9, Lines 196-198*).

Review Comments (Round 2)

Reviewer A: *The authors have responded comprehensively to my comments and suggestions and have modified their work accordingly. Only a flow diagram would be desirable. The publication could thus be endorsed.*

Response: We appreciate the Reviewer's comment. As suggested, a flow diagram was added (see Page 5, lines 102-103 and Figure 1).